

METHOD AND APPARATUS FOR VISUALIZATION OF 3D VOXEL DATA USING LIT OPACITY VOLUMES WITH SHADING

Abstract of the Disclosure

1 A volume rendering process is disclosed for improving the visual quality of
2 images produced by rendering and displaying volumetric data in voxel format for the
3 display of three-dimensional (3D) data on a two-dimensional (2D) display with shading
4 and opacity to control the realistic display of images rendered from the voxels. The
5 process includes partitioning the plurality of voxels among a plurality of slices with each
6 slice corresponding to a respective region of the volume. Each voxel includes an opacity
7 value adjusted by applying an opacity curve to the value. The opacity value of each
8 voxel in each cell in the volume is converted into a new visual opacity value that is used
9 to calculate a new visual opacity gradient for only one voxel in the center of each cell.
10 The visual opacity gradient is used to calculate the shading, used to modify the color of
11 individual voxels based on the orientation of opacity isosurfaces passing through each
12 voxel in the volume, in order to create a high quality, realistic image.